

Fig. 1a. Model of generation of inter-bin interference in windowed DMT receiver

002050-11195500

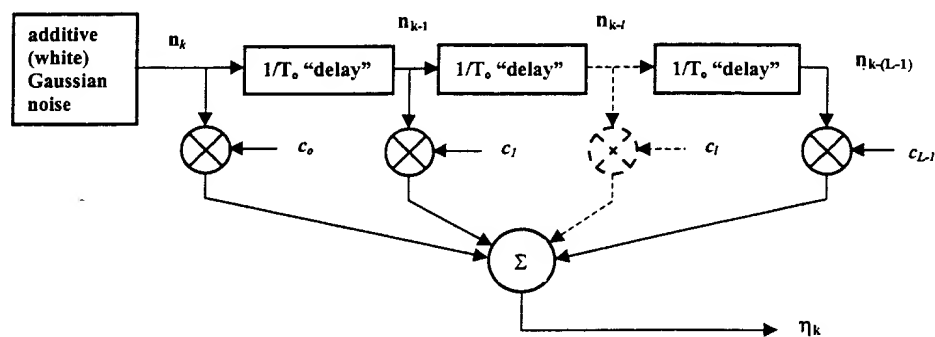


Fig. 1b. Model of noise coloration in windowed DMT receiver

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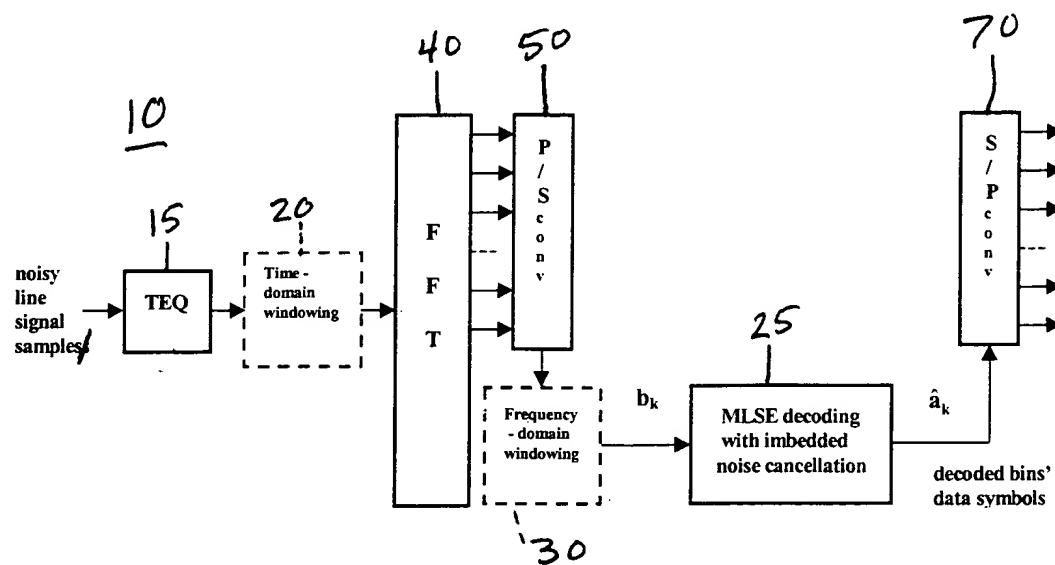


Fig. 2. Illustration of MLSE PRS decoding with noise cancellation in windowed DMT receiver with TEQ.

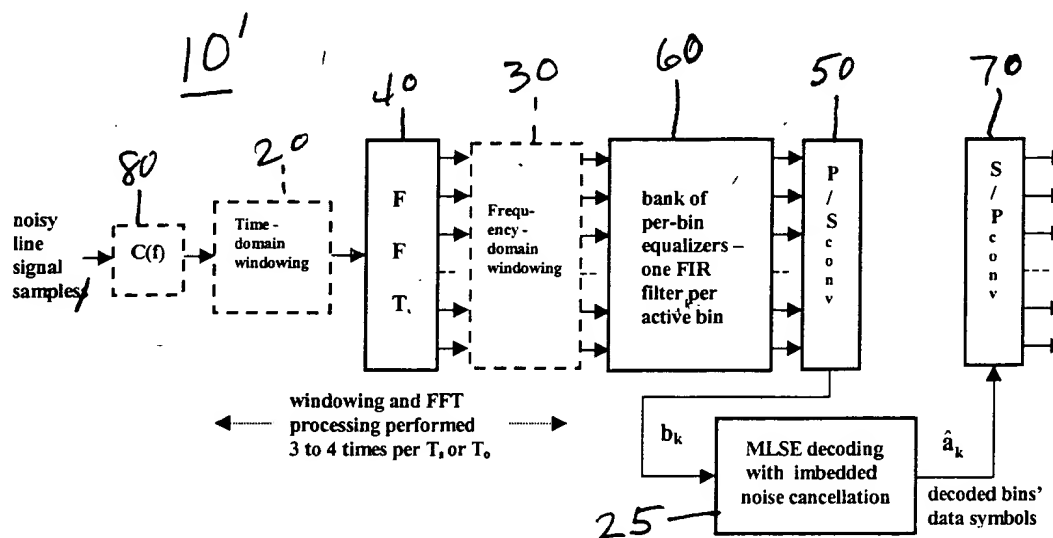


Fig. 3. Illustration of MLSE decoding and noise cancellation in windowed DMT receiver with per-bin equalizer TEQ eliminated, largely simplified or replaced by a simple compromising corrector,  $C(f)$ , of telephone line amplitude characteristic.

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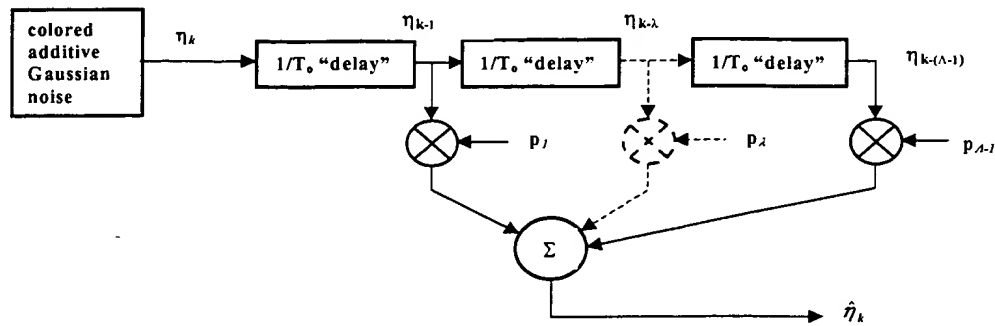


Fig.4. Principal block diagram of noise prediction procedure

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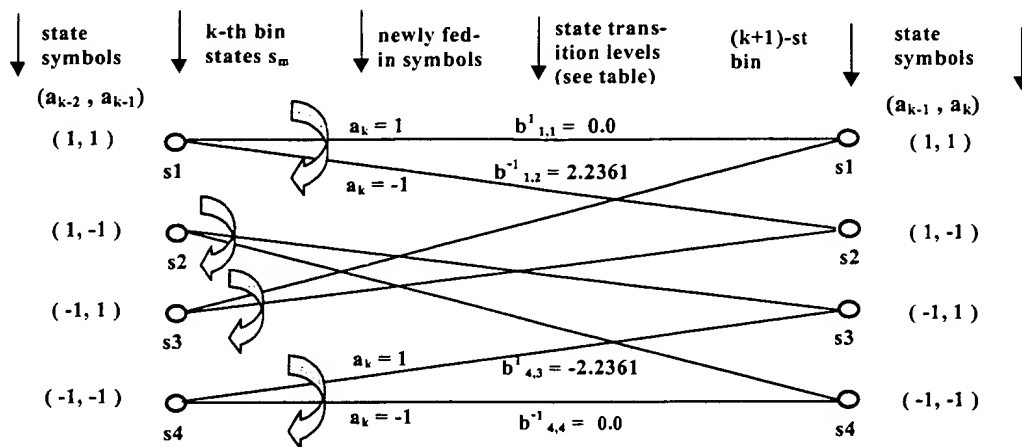


Fig. 5. 4-state trellis diagram corresponding to in-phase or quadrature part of 2-bit constellations; data symbols at c<sub>i</sub> tap location of Fig. 1 are presented as samples to the right within brackets.

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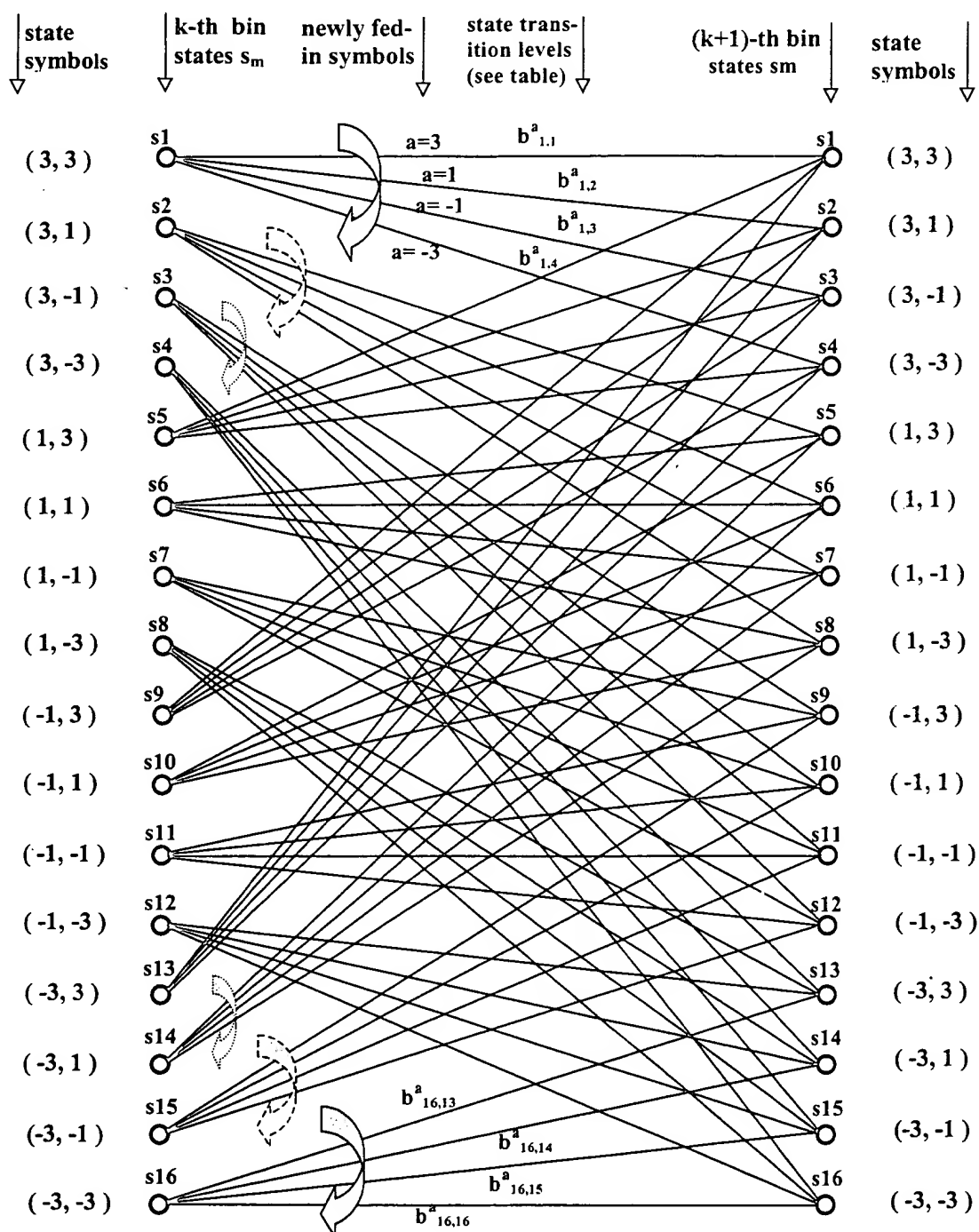


Fig. 6. 16-level trellis diagram for in-phase or quadrature components of 4-bit constellations; symbols at  $c_1$  tap location of Fig.1 are presented as samples to the right within brackets.





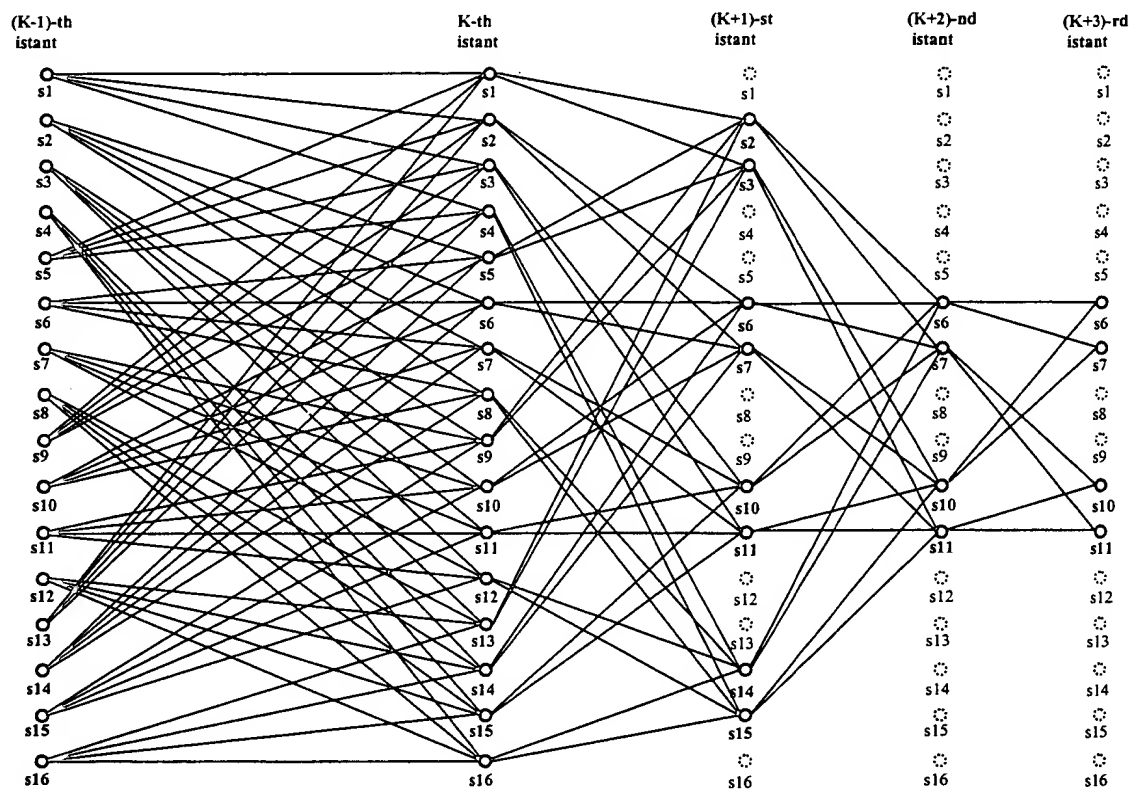


Fig. 8. An example of trellis diagram for abrupt change of number of bits between K-th and (K+1)-st bin from 4 to 2.

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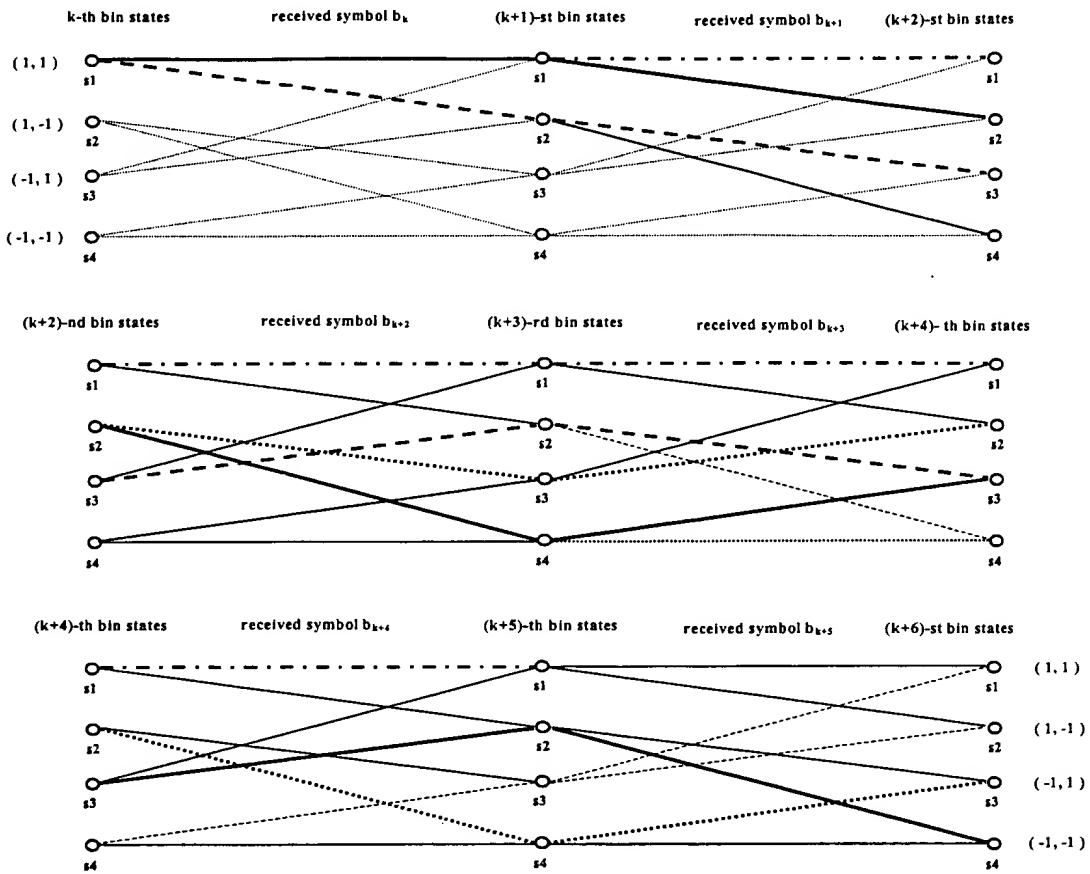
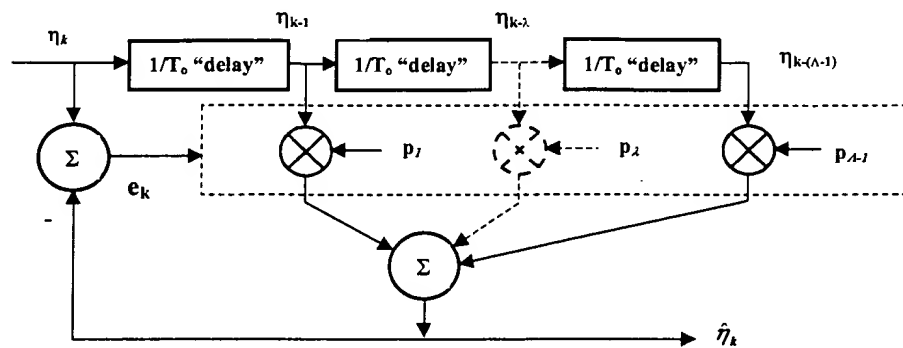


Fig. 9. An example of backward trellis procedure; the last two symbols prior to sending  $k$ -th bin symbol are taken to be 1 and 1; the symbols transmitted on bins from  $k$  to  $k+5$  are taken to be 1, -1, -1, 1, -1 and -1 so that correct path is shown by bold line; decoding depth is 6.

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**Fig.9a. Illustration of LMS estimation of predictor coefficients**

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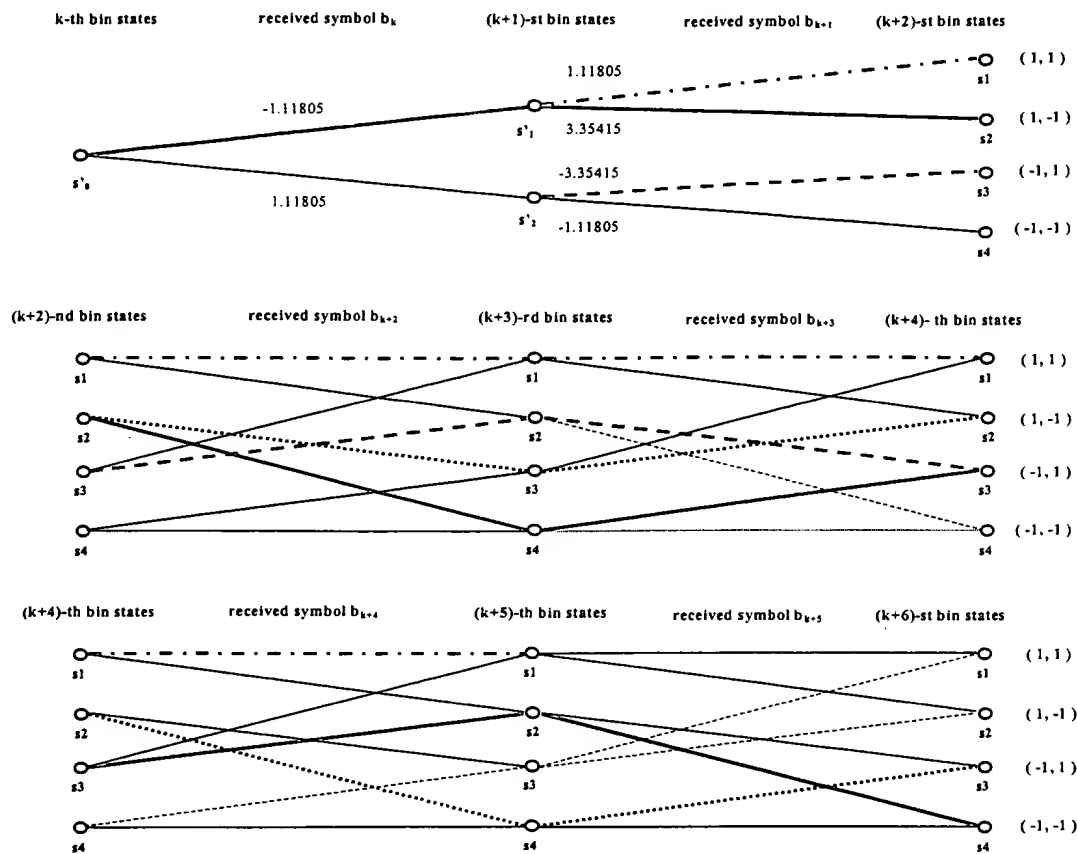


Fig. 10. An example of backward trellis procedure; the last two symbols prior to sending  $k$ -th bin symbol are taken to be 0 and 0; the symbols transmitted on bins from  $k$  to  $k+5$  are taken to be 1, -1, -1, 1, -1 and -1 so that correct path is shown by bold line; decoding depth is 6. State transition values for first two trellis stages are different from those in table 1 and are shown here.

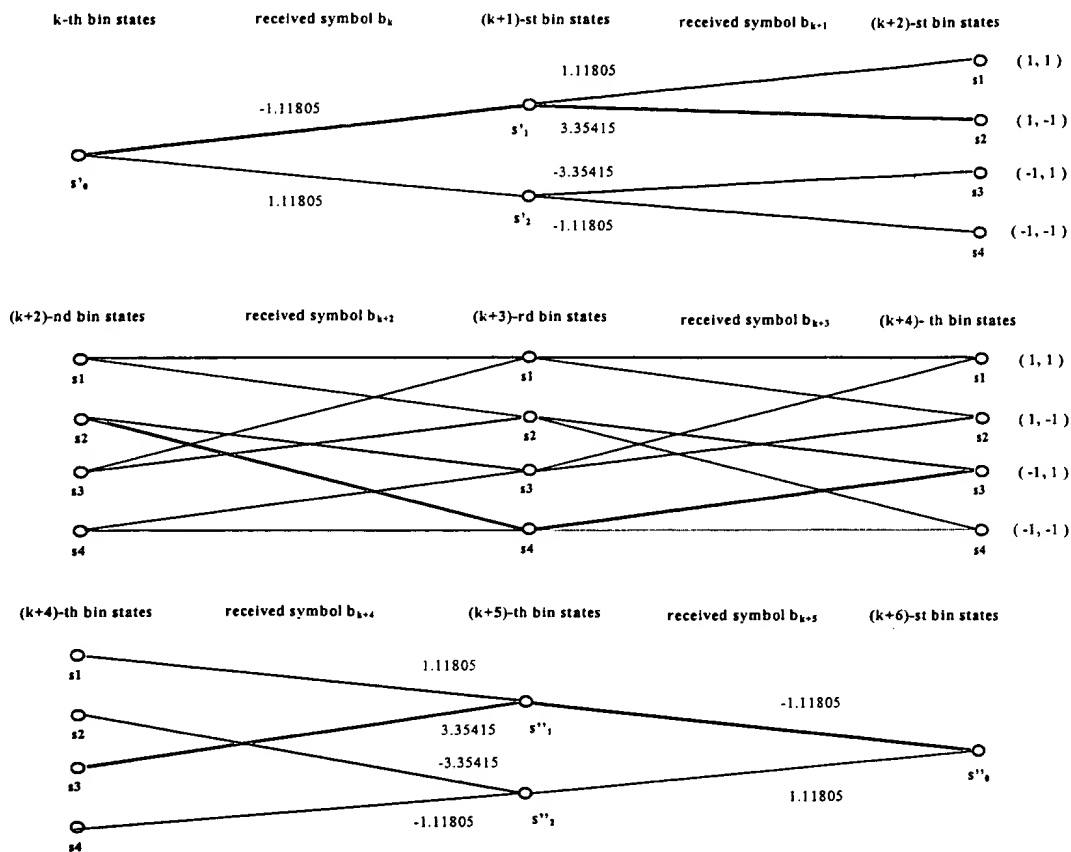


Fig. 11. An example of exhaustive MLSE procedure in case of four active bins separated from other symbols by two zero valued bins; the symbols transmitted on bins from  $k$  to  $k+3$  are taken to be 1, -1, -1 and 1 so that correct path is shown by bold line; State transition values for auxiliary first two and the last two trellis stages are different from those in table 1 and are shown here.